TRAINING CURRICULUM

Immobilization Endorsement

Curriculum Objectives for the EMT-F

Montana Department of Labor
Board of Medical Examiners

The purpose of the Immobilization Endorsement for EMT-F is to provide the EMT-F with the knowledge and skills to expedite preparation for transport of a patient with suspected orthopedic injuries.

FORWARD

The Montana Board of Medical Examiners (BOME) developed the EMT endorsement process to provide the local EMS medical director the ability to expand the individual EMT scope of practice. The BOME has defined the "maximum allowable" skills for each endorsement and established statewide protocols. The endorsement process consists of education and verification.

The local EMS medical director is responsible for verifying an EMT's knowledge and skills for a particular endorsement. This can be accomplished via a training program; or the medical director may take into account an EMT's previous education, skill ability or other personal knowledge to determine whether an EMT meets the endorsement knowledge and skill requirements. The local medical director is responsible for the quality of all endorsement training via direct participation and/or oversight.

The medical director cannot exceed the scope of the endorsement, but may set limits on the ambulance service or the individual EMT. As an example, the medical director might wish the local ambulance service or an individual EMT to utilize pulse oximetry but not cardiac monitoring.

The endorsement material that follows provides the knowledge and psychomotor objectives at the specific endorsement level. Some endorsements may also include sample lesson plans for use in presenting the material. The endorsements (specifically at the EMT-Intermediate and EMT-Paramedic levels) may be non-specific in certain areas (such as specific medications or routes of administration) as the Board does not intend to "practice medicine". The medical director "practices medicine" and has the ability to determine the specific's concerning the endorsement. The Board approved protocols define the extent of the local medical directors flexibility: "…*The Board authorizes the service medical director to use the Board approved protocols in their entirety or may determine to limit individual EMT providers function / practice where appropriate and in accordance with provider's abilities. However, the service medical director may not significantly alter (change the performance expectations of the EMT) or expand approved Board protocols without first seeking Board of Medical Examiners approval.*" If the medical director wishes to request the Board to "significantly alter" the protocol there is a process identified in the rules for that to occur.

The endorsement levels at the EMT-Paramedic level are slightly different then at the other levels in that all of the endorsement levels are subsets of the Critical Care endorsement. Therefore if a Critical Care endorsement is granted to an EMT-P, they have completed all of the other endorsements. This does not work in reverse though, if an EMT-P has all of the endorsement levels but Critical Care, Critical Care is not granted by default.

The endorsement process for the EMT-First Responder level is also slightly different. The local Lead Instructor is allowed to document the successful completion of the educational requirements for the EMT-F endorsements: ambulance, immobilization or EMTF-monitoring. The Lead Instructor may not take into consideration previous education or training as the local medical director is allowed when completing the individual's verification form. The Lead Instructor can only verify the individual's successful completion of the training/educational requirements. This is only allowed at the EMT-F endorsement levels of: ambulance, immobilization or EMTF-monitoring. The Lead Instructor must remember the endorsement process is a privilege granted to a Montana licensed EMT. Endorsement education can only be offered to Montana EMT licensees; therefore, the Lead Instructor may not combine initial EMT First Responder education and an endorsement program together (such as a First Responder and ambulance endorsement). The endorsement education must be done independently of the initial program.

The endorsement process requires that the medical director complete a standardized "verification form" (certificate of completion) documenting that an individual EMT has the knowledge and skills identified at the specific endorsement level. The individual EMT then submits an application to the Board to establish the endorsement on their license. The medical director then has the option of granting permission to the individual EMT to perform the endorsement to the extent defined by the medical director. All forms and endorsement materials can be obtained from the web site; www.emt.mt.gov. Any questions or concerns can be addressed to Ken Threet at (406) 841-2359 or kthreet@mt.gov.

COGNITIVE OBJECTIVES

At the completion of this lesson, the Immobilization Endorsement student will be able to:

IM-1.1 State the reasons for splinting.(C-1)
IM-1.2 List the general rules of splinting.(C-1)
IM-1.3 List the complications of splinting.(C-1)

AFFECTIVE OBJECTIVES

At the completion of this lesson, the Immobilization Endorsement student will be able to:

IM-1.4 Explain the rationale for splinting at the scene versus load and go.(A-3)
IM-1.5 Explain the rationale for immobilization of the painful, swollen, deformed extremity.(A-3)

PSYCHOMOTOR OBJECTIVES

At the completion of this lesson, the Immobilization Endorsement student will be able to:

IM-1.6 Demonstrate completing a prehospital care report for patients with musculoskeletal injuries.(P-2)

LESSON PLAN:

Declarative (What)
I. Musculoskeletal Review
- A. Anatomy review
- B. The skeletal system

II. Injuries to bones
- A. Mechanism of injury
- B. Bone or joint injuries
  - 1. Types
  - 2. Signs and symptoms
  - 3. Emergency medical care of bone or joint injuries
    - a. Administer oxygen if not already done and indicated.
    - b. After life threats have been controlled, splint injuries in preparation for transport.
    - c. Elevate the extremity.

III. Splinting
- A. Reasons
  - 1. Prevent motion of bone fragments, bone ends or angulated joints.
  - 2. Minimize the following complications:
    - a. Damage to muscles, nerves, or blood vessels caused by broken bones.

b. Conversion of a closed painful, swollen, deformed extremity to an open painful, swollen, deformed extremity.
c. Restriction of blood flow as a result of bone ends compressing blood vessels.
d. Excessive bleeding due to tissue damage caused by bone ends.
e. Increased pain associated with movement of bone ends.
f. Paralysis of extremities due to a damaged spine.

B. General rules of splinting

1. Assess pulse, motor, and sensation distal to the injury prior to and following splint application and record findings.
2. Immobilize the joint above and below the injury.
3. Remove or cut away clothing.
4. Cover open wounds with a sterile dressing.
5. If there is a severe deformity or the distal extremity is cyanotic or lacks pulses, align with gentle traction before splinting.
6. Do not intentionally replace the protruding bones.
7. Pad each splint to prevent pressure and discomfort to the patient.
8. Splint the patient before moving when feasible and no life threats.
9. When in doubt, splint the injury when feasible and no life threats.
10. If patient has signs of shock (hypoperfusion), align in normal anatomical position and transport (Total body immobilization. Example: Backboard takes care of all immobilization on emergency basis).

C. Equipment

1. Rigid splints
2. Traction splints
3. Pneumatic splints (air, vacuum)
4. Improvised splints, pillow

D. Hazards of improper splinting

1. Compression of nerves, tissues and blood vessels from the splint
2. Delay in transport of a patient with life threatening injury
3. Splint applied too tight on the extremity reducing distal circulation
4. Aggravation of the bone or joint injury
5. Cause or aggravate tissue, nerve, vessel or muscle damage from excessive bone or joint movement

E. Special considerations of splinting

1. Long bone splinting procedure
    a. Body substance isolation
    b. Apply manual stabilization.
    c. Assess pulse, motor and sensory function.
    d. If there is a severe deformity or the distal extremity is cyanotic or lacks pulses, align with gentle traction before splinting.
    e. Measure splint.
    f. Apply splint immobilizing the bone and joint above and below the injury.
    g. Secure entire injured extremity.
    h. Immobilize hand/foot in position of function.
    i. Reassess pulse, motor, and sensation after application of splint and record.
2. Splinting a joint injury
    a. Body substance isolation

b. Apply manual stabilization.
c. Assess pulse, motor and sensory function.
d. Align with gentle traction if distal extremity is cyanotic or lacks pulses and no resistance is met.
e. Immobilize the site of injury.
f. Immobilize bone above and below the site of injury.
g. Reassess pulse, motor and sensation after application of splint and record.

3. Traction splinting
   a. Indications for use is a painful, swollen, deformed mid-thigh with no joint or lower leg injury.
   b. Contraindications of the use of a traction splint
      (1) Injury is close to the knee
      (2) Injury to the knee exists
      (3) Injury to the hip
      (4) Injured pelvis
      (5) Partial amputation or avulsion with bone separation, distal limb is connected only by marginal tissue. Traction would risk separation.
      (6) Lower leg or ankle injury.
   c. Traction splinting procedure
      (1) Assess pulse, motor, and sensation distal to the injury and record.
      (2) Body substance isolation
      (3) Perform manual stabilization of the injured leg.
      (4) Apply manual traction - required when using a bi-polar traction splint.
      (5) Prepare/adjust splint to proper length.
      (6) Position splint under injured leg.
      (7) Apply proximal securing device (ischial strap).
      (8) Apply distal securing device (ankle hitch).
      (9) Apply mechanical traction.
      (10) Position/secure support straps.
      (11) Re-evaluate proximal/distal securing devices.
      (12) Reassess pulses, motor, sensation distal to the injury after application of the splint and record.
      (13) Secure torso to the longboard to immobilize hip.
      (14) Secure splint to the long board to prevent movement of splint.

Procedural (How)

1. Demonstrate splinting procedures relevant to the general rules of splinting using: Rigid splints, traction splints, pneumatic splints, and improvised splints.
2. Demonstrate procedure for splinting an injury with distal cyanosis or lacking a distal pulse.

Contextual (When, Where, Why)

Injuries to bones and joints require splinting prior to the movement of the patient unless lifethreatening injuries are present. If life-threatening injuries are present, splinting should be done en route to the receiving facility when possible.
Failure to splint or improperly splinting a bone or joint injury can result in damage to soft tissue, organs, nerves, muscles; increased bleeding associated with the injury; permanent damage or disability; conversion of a closed injury to an open injury; and an increase in pain.

STUDENT ACTIVITIES

Visual (See)
1. The student should see a demonstration of splinting procedures relevant to the general rules of splinting using: Rigid splints, traction splints, pneumatic splints, and improvised splints.

2. The student should see a demonstration of the procedure for splinting an injury with distal cyanosis or lacking a distal pulse.

Kinesthetic (Do)
1. The student should practice splinting procedures relevant to the general rules of splinting using: Rigid splints, traction splints, pneumatic splints, and improvised splints.

2. The student should practice procedure for splinting an injury with distal cyanosis or lacking a distal pulse.

3. The student should practice completing a prehospital care report for patients with musculoskeletal injuries.

INSTRUCTOR ACTIVITIES
Supervise student practice.
Reinforce student progress in cognitive, affective, and psychomotor domains.
Redirect students having difficulty with content.

COGNITIVE OBJECTIVES

At the completion of this lesson, the Immobilization Endorsement student will be able to:

IM-2.1 Describe the implications of not properly caring for potential spine injuries.(C-1)
IM-2.2 Relate the airway emergency medical care techniques to the patient with a suspected spine injury.(C-3)
IM-2.3 Describe how to stabilize the cervical spine.(C-1)
IM-2.4 Discuss indications for sizing and using a cervical spine immobilization device.(C-1)
IM-2.5 Establish the relationship between airway management and the patient with head and spine injuries.(C-1)

IM-2.6 Describe a method for sizing a cervical spine immobilization device.(C-1)
IM-2.7 Describe how to log roll a patient with a suspected spine injury.(C-1)
IM-2.8 Describe how to secure a patient to a long spine board.(C-1)
IM-2.9 List instances when a short spine board should be used.(C-1)
IM-2.10 Describe how to immobilize a patient using a short spine board.(C-1)

AFFECTIVE OBJECTIVES

At the completion of this lesson, the Immobilization Endorsement student will be able to:

IM-2.11 Explain the rationale for immobilization of the entire spine when a cervical spine injury is suspected.(A-3)
IM-2.12 Explain the rationale for utilizing immobilization methods apart from the straps on the cots.(A-3)
IM-2.13 Explain the rationale for utilizing a short spine immobilization device when moving a patient from the sitting to the supine position.(A-3)

PSYCHOMOTOR OBJECTIVES

At the completion of this lesson, the Immobilization Endorsement student will be able to:

IM-2.14 Demonstrate the four person log roll for a patient with a suspected spinal cord injury.(P-1,2)
IM-2.1IM Demonstrate how to log roll a patient with a suspected spinal cord injury using two people.(P-1,2)
IM-2.16 Demonstrate securing a patient to a long spine board.(P-1,2)
IM-2.17 Demonstrate using the short board immobilization technique.(P-1,2)

LESSON PLANS:

Declarative (What)
I. The Nervous System Review
    A. Components
    B. Actions
II. The Skeletal System
    A. Functions
    B. Components
        1. Skull
        2. Spinal column
            a. 33 bones
            b. Surrounds and protects the spinal cord.
III. Injuries to the Spine
    A. Mechanism of injury
        1. Compression
            a. Falls
            b. Diving accidents
            c. Motor vehicle accidents
        2. Excessive flexion, extension, rotation

3. Lateral bending
4. Distraction
    a. Pulling apart of the spine
    b. Hangings
5. Maintain a high index of suspicion
    a. Motor vehicle crashes
    b. Pedestrian - vehicle collisions
    c. Falls
    d. Blunt trauma
    e. Penetrating trauma to head, neck, or torso
    f. Motorcycle crashes
    g. Hangings
    h. Diving accidents
    i. Unconscious trauma victims

B. Signs and symptoms
1. Ability to walk, move extremities or feel sensation; or lack of pain to spinal column does not rule out the possibility of spinal column or cord damage.
2. Tell the patient not to move while asking questions.
3. Pain independent of movement or palpation
4. Obvious deformity of the spine upon palpation
5. Soft tissue injuries associated with trauma

C. Assessing the potential spine injured patient
1. Responsive patient
    a. Mechanism of injury
    b. Questions to ask
        (1) Does your neck or back hurt?
        (2) What happened?
        (3) Where does it hurt?
        (4) Can you move your hands and feet?
        (5) Can you feel me touching your fingers?
        (6) Can you feel me touching your toes?
    c. Inspect for contusions, deformities, lacerations, punctures, penetrations, swelling.
    d. Palpate for areas of tenderness or deformity.
    e. Assess equality of strength of extremities
        (1) Hand grip
        (2) Gently push feet against hands
2. Unresponsive patient
    a. Mechanism of injury
    b. Initial assessment
    c. Inspect for:
        (1) Contusions
        (2) Deformities
        (3) Lacerations
        (4) Punctures/penetrations
        (5) Swelling
    d. Palpate for areas of tenderness or deformity.
    e. Obtain information from others at the scene to determine information relevant to mechanism of injury or patient mental

status prior to the EMT-F WITH IMMOBILIZATION ENDORSMENT's arrival.

D. Emergency medical care

1. Establish and maintain in-line immobilization.
    a. Place the head in a neutral in-line position unless the patient complains of pain or the head is not easily moved into position.
    b. Place head in alignment with spine.
    c. Maintain constant manual in-line immobilization until the patient is properly secured to a backboard with the head immobilized.
2. Perform initial assessment.
3. Assess pulse, motor and sensation in all extremities.
4. Assess the cervical region and neck.
5. Apply a rigid, cervical immobilization device.
    a. Properly size the cervical immobilization device. If it doesn't fit use a rolled towel and tape to the board and have rescuer hold the head manually.
    b. An improperly fit immobilization device will do more harm than good.
6. If found in a lying position, immobilize the patient to a long spine board.
    a. Position the device.
    b. Move the patient onto the device by log rolling.
        (1) One EMT-F WITH IMMOBILIZATION ENDORSMENT must maintain in-line immobilization of the head and spine.
        (2) EMT-F WITH IMMOBILIZATION ENDORSMENT at the head directs the movement of the patient.
        (3) One to three other EMT-F WITH IMMOBILIZATION ENDORSMENTs control the movement of the rest of the body.
        (4) Quickly assess posterior body if not already done in focused history and physical exam.
        (5) Position the long spine board under the patient.
        (6) Place patient onto the board at the command of the EMT-F WITH IMMOBILIZATION ENDORSMENT holding in-line immobilization using a slide, proper lift, log roll or scoop stretcher so as to limit movement to the minimum amount possible. Which method to use must be decided based upon the situation, scene and available resources.
        (7) Pad voids between the patient and the board.
            (a) Adult
                i) Under the head
                ii) Voids under torso. Be careful of extra movement.
            (b) Infant and child - pad under the shoulders to the toes to establish a neutral position.
        (8) Immobilize torso to the board.
        (9) Immobilize the patient's head to the board.
        (10) Secure the legs to the board.
        (11) Reassess pulses, motor and sensation and record.
7. If the patient is found in a sitting position in a chair, immobilize with a

short spine immobilization device. Exception: If the patient must be removed urgently because of his injuries, the need to gain access to others, or dangers at the scene, he must then be lowered directly onto a longboard and removed with manual immobilization provided.

a. Position device behind the patient.

b. Secure the device to the patient's torso.

c. Evaluate torso fixation and adjust as necessary without excessive movement of the patient.

d. Evaluate and pad behind the patient's head as necessary to maintain neutral in-line immobilization.

e. Secure the patient's head to the device.

f. Insert a longboard under the patient's buttocks and rotate and lower him to it. If not possible, lower him to the long spine board.

g. Reassess pulses, motor and sensory in all extremities and record.

8. If the patient is found in a standing position, immobilize the patient to a long spine board.

a. Position the device behind patient.

b. Move the patient onto the device by:

(1) One rescuer on each side of the patient, one additional rescuer at the foot facing the patient.

(2) The rescuers on both sides of the patient reach with the hand closest to the patient under the arm to grasp the board, and use the hand farthest from the patient to secure the head.

(3) Once the position is assured, they place the leg closest to the board behind the board and begin to tip the top backward. The rescuer at the foot of the board secures the board and the patient to prevent them from sliding, and the board is brought into a level horizontal position.

9. If the patient is critically injured, perform a rapid extrication.

10. Transport the patient immediately.

a. Bring body into alignment.

b. Transfer to long board without short spine board.

IV. Injuries to the Brain and Skull

A. Head injuries

B. Related non-traumatic conditions

C. Skull injury - signs and symptoms

D. Head injury

E. Open head injury

F. Emergency medical care

V. Immobilization

A. Cervical spine immobilization devices

1. Indications

a. Any suspected injury to the spine based on mechanism of injury, history or signs and symptoms.

b. Use in conjunction with short and long backboards.

2. Sizing

a. Various types of rigid cervical immobilization devices exist, therefore, sizing is based on the specific design of the device.

b. An improperly sized immobilization device has a potential for

further injury.

c. Do not obstruct the airway with the placement of a cervical immobilization device.

d. If it doesn't fit use a rolled towel and tape to the board and manually support the head. An improperly fit device will do more harm than good.

3. Precautions

a. Cervical immobilization devices alone do not provide adequate inline immobilization.

b. Manual immobilization must always be used with a cervical immobilization device until the head is secured to a board.

B. Short backboards

1. Several different types of short board immobilization devices exist.

a. Vest type devices

b. Rigid short board

2. Provides stabilization and immobilization to the head, neck and torso.

3. Used to immobilize non-critical sitting patients with suspected spinal injuries.

4. General application

a. Start manual in-line immobilization.

b. Assess pulses, motor and sensory function in all extremities.

c. Assess the cervical area.

d. Apply a cervical immobilization device.

e. Position short board immobilization device behind the patient.

f. Secure the device to the patient's torso.

g. Evaluate torso and groin fixation and adjust as necessary without excessive movement of the patient.

h. Evaluate and pad behind the patient's head as necessary to maintain neutral in-line immobilization.

i. Secure the patient's head to the device.

j. Release manual immobilization of head.

k. Rotate or lift the patient to the long spine board.

l. Immobilize patient to long spine board.

m. Reassess pulses, motor and sensory function in all extremities.

C. Long backboards (Full body spinal immobilization devices)

1. Several different types of long board immobilization devices exist.

2. Provide stabilization and immobilization to the head, neck and torso, pelvis and extremities.

3. Used to immobilize patients found in a lying, standing, or sitting position.

4. Sometimes used in conjunction with short backboards.

5. General application

a. Start manual in-line immobilization.

b. Assess pulses, motor and sensory function in all extremities.

c. Assess the cervical area.

d. Apply a cervical immobilization device.

e. Position the device.

f. Move the patient onto the device by log roll, suitable lift or slide, or scoop stretcher. A log roll is:

(1) One EMT-F WITH IMMOBILIZATION ENDORSMENT must maintain in-line immobilization.

(2) EMT-F WITH IMMOBILIZATION ENDORSMENT at the head directs the movement of the patient.
(3) One to three other EMT-F WITH IMMOBILIZATION ENDORSMENTs control the movement of the rest of the body.
(4) Quickly assess posterior body if not already done in initial assessment.
(5) Position the long spine board under the patient.
(6) Roll patient onto the board at the command of the EMT-F WITH IMMOBILIZATION ENDORSMENT holding in-line immobilization.

g. Pad voids between the patient and the board.
(1) Adult
(a) Under the head as needed
(b) Under the torso as needed
(2) Infant and child - pad under the shoulders to the toes to establish a neutral position.

h. Immobilize torso to the board by applying straps across the chest and pelvis and adjust as needed.
i. Immobilize the patient's head to the board.
j. Fasten legs, proximal to and distal to the knees.
k. Reassess pulses, motor and sensation and record.

Procedural (How)

1. Show audio-visual aids or materials of related mechanism of injury to potential injuries of the head and spine.
2. Show audio-visual aids or materials of potential signs and symptoms of a potential spine injury.
3. Demonstrate the method of determining if a responsive patient may have a spine injury.
4. Demonstrate the airway emergency medical care techniques for the patient with a suspected spinal cord injury.
5. Demonstrate methods for sizing various cervical spine immobilization devices.
6. Demonstrate how to stabilize the cervical spine.
7. Demonstrate how to immobilize a patient using a short spine board.
8. Demonstrate how to log roll a patient with a suspected spine injury.
9. Demonstrate how to secure a patient to a long spine board.

Kinesthetic (Do)

1. The student should practice opening the airway in a patient with suspected spinal cord injury.
2. The student should practice evaluating a responsive patient with a suspected spinal cord injury.
3. The student should practice stabilization of the cervical spine.
4. The student should practice using the short board immobilization technique.
5. The student should practice the four person log roll for a patient with a suspected spinal cord injury.

6. The student should practice how to log roll a patient with a suspected spinal cord injury using two people.
7. The student should practice securing a patient to a long spine board.
8. The student should practice preferred methods for stabilization of the head.
9. The student should practice alternative methods for stabilization of the head.
10. The student should practice completing a prehospital care report for patients with head and spinal injuries.